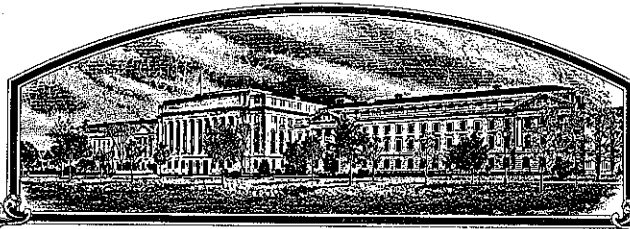


No.



9100158

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME;

Pioneer Hi-Bred International, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED, PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE FOREGOING PURPOSES, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

ALFALFA

'5888'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this thirty-first day of August in the year of our Lord one thousand nine hundred and ninety-five.

Attest:

Acting Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary of Agriculture



U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE
(Instructions on reverse)

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) (as it is to appear on the Certificate) Pioneer Hi-Bred International, Inc.		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NO. XAN82	3. VARIETY NAME 5888
4. ADDRESS (street and no. or R.F.D. no., city, state, and ZIP) 7305 N. W. 62nd Avenue, P.O. Box 287 Johnston, IA 50131		5. PHONE (include area code) 515-270-3340	FOR OFFICIAL USE ONLY PVPO NUMBER 9100158
6. GENUS AND SPECIES NAME Medicago sativa	7. FAMILY NAME (Botanical) Leguminosae		FILING Date March 27, 1991 Time <input type="checkbox"/> A.M. <input type="checkbox"/> P.M.
8. CROP KIND NAME (Common Name) Alfalfa	9. DATE OF DETERMINATION August, 1986	FILING Filing and Examination Fee: \$2150. ⁰⁰ Date March 27, 1991 Certificate Fee: \$250.00 \$450.00 Date May 30, 1995	
10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION (Corporation, partnership, association, etc.) Corporation		RECEIVED	
11. IF INCORPORATED, GIVE STATE OF INCORPORATION Iowa	12. DATE OF INCORPORATION 1926		
13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS			

William T. W. Woodward, 7305 N. W. 62nd Avenue, P. O. Box 287, Johnston, IA 50131
Mary Helen Mitchell, 700 Capital Square, 400 Locust Street, Des Moines, IA 50309
John Hintze, 700 Capital Square, 400 Locust Street, Des Moines, IA 50309
PHONE (include area code):

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow INSTRUCTIONS on reverse)			
a. <input checked="" type="checkbox"/> Exhibit A, Origin and Breeding History of the Variety. b. <input checked="" type="checkbox"/> Exhibit B, Novelty Statement. c. <input checked="" type="checkbox"/> Exhibit C, Objective Description of Variety. d. <input checked="" type="checkbox"/> Exhibit D, Additional Description of Variety. e. <input checked="" type="checkbox"/> Exhibit E, Statement of the Basis of Applicant's Ownership. f. <input checked="" type="checkbox"/> Seed Sample (2,500 viable untreated seeds) Date Seed Sample mailed to Plant Variety Protection Office March 13, 1991 g. <input checked="" type="checkbox"/> Filing and Examination Fee (\$2,150) made payable to "Treasurer of the United States."			
15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? (See section 83(a) of the Plant Variety Protection Act) <input type="checkbox"/> YES (If "YES," answer items 16 and 17 below) <input checked="" type="checkbox"/> NO (If "NO," skip to item 18 below)			
16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED? <input checked="" type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input checked="" type="checkbox"/> CERTIFIED	
18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S. <input type="checkbox"/> YES (If "YES," through <input type="checkbox"/> Plant Variety Protection Act <input type="checkbox"/> Patent Act Give date _____) <input checked="" type="checkbox"/> NO			
19. HAS THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETING IN THE U.S. OR OTHER COUNTRIES? <input checked="" type="checkbox"/> YES (If "YES," give names of countries and dates) <input type="checkbox"/> NO U. S. A. Fall of 1990			

20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in section 41, and is entitled to protection under the provisions of section 42 of the Plant Variety Protection Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT [Owner(s)] PIONEER HI-BRED INTERNATIONAL, INC.	CAPACITY OR TITLE	DATE
SIGNATURE OF APPLICANT [Owner(s)] BY <u>William T. W. Woodward</u>	Director, Department of Alfalfa Breeding	3-12-91

EXHIBIT A

ORIGIN AND BREEDING HISTORY OF THE VARIETY

'5888'

5888 is a synthetic variety comprised from 108 plants originating from 5929 (50%) and a Pioneer experimental 75MA-1 (50%). 75MA-1 traces to N71 Brand (30%), Sonora (26%), El Camino (14%), Bonanza (2%), WL 202 (7%), WL 501 (4%), with smaller contribution from Moapa, Hayden and other Pioneer experimental lines. Parent plants were selected through phenotypic recurrent selection for Phytophthora root rot and stem nematode. Syn 1 seed harvested in 1986 and 1987 from parent plants in "cage isolation" and was bulked and designated breeder seed.

During seed multiplication no variates beyond the limits defined under Exhibit C have been found. Multiplication procedures will insure that seed being sold as 5888 will not be shifted in characteristics beyond presently acceptable limits for alfalfa varieties.

It is confirmed that 5888 meets presently acceptable levels for uniformity for alfalfa varieties.

9100158
Replaced
29 Apr 1994
AAA

EXHIBIT B

NOVELTY STATEMENT

'5888'

5888 most closely resembles the variety 'DK 187'. 5888 differs from DK 187 in blue alfalfa aphid resistance being classified as resistant, while DK 187 has moderate resistance.

Exhibit B.

9100158



PIONEER®

December 16, 1993

PIONEER HI-BRED INTERNATIONAL, INC.
PLANT BREEDING DIVISION

DEPARTMENT OF ALFALFA BREEDING
P.O. BOX 287 • JOHNSTON, IOWA 50131
PHONE: (515) 270-3340
TELEFAX: (515) 270-3750

Alan Atchley
Plant Variety Protection Office
Agricultural Marketing Service
U. S. Department of Agriculture
Room 500, National Agricultural Library Bldg.
10301 Baltimore Blvd.
Beltsville, MD 20705

Re: PVP Application No. 9100158, Alfalfa variety '5888'

Dear Alan:

I talked to Ken Evans today and he thought that the flower color data we submitted could be used to separate 5888 and DK187; however, he would like to see some additional evidence. Although it could be done with a good blue aphid test, this type of test takes more time and is more costly. We do have a test being established for blue aphid determination but I thought I would try the Fusarium wilt tests that are available.

DK187 was tested at the University of Minnesota in 1982 for Fusarium wilt resistance while 5888 was tested in 1989 at the same university. The resistant check, Moapa 69, was within the ranges allowed in both tests showing percent resistant plants at 83.3 and 83.2 in 1982 and 1989, respectively. These two tests were very close in classification of varieties. When the data is adjusted to Moapa 69 at 76% resistant plants, DK187 has 54.2% resistant plants while 5888 has 71.3% resistant plants. This would meet the significant difference rule based on one LSD equaling approximately 10% resistant plants for pest traits when observing different tests to determine differences in varieties.

The 1982 test was used in the review board application in 1983 for DK187 and the 1989 test was used for 5888 submitted in 1990. Both pieces of data should be the data used for Fusarium wilt in your files.

Would this, along with the flower color data previously submitted, suffice in separating these two varieties?

Sincerely,

W. T. W. Woodward, Director
Department of Alfalfa Breeding

WTWW:ml

CC: Ken Evans

HELPING AGRICULTURE GROW THROUGH GENETIC RESEARCH

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
INVESTIGATIVE, MARKETING, AND SEED DIVISION
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MARYLAND 20705

1-10-11
(Amp)

OBJECTIVE DESCRIPTION OF VARIETY
ALFALFA (*Medicago sativa* sensu Gunn et al.)

NAME OF APPLICANT(S) Pioneer Hi-Bred International, Inc.	TEMPORARY DESIGNATION XAN82	VARIETY NAME 5888
ADDRESS (Street and No., or R.F.D. No., City, State, and Zip Code) 7305 N. W. 62nd Avenue, P. O. Box 287 Johnston, IA 50131		FOR OFFICIAL USE ONLY PVPO NUMBER 9100158

PLEASE READ ALL INSTRUCTIONS CAREFULLY: Place numbers in the boxes to designate the expressions which are characteristic of the commercial generations of the application variety. Data for quantitative plant characters should be based on a minimum of 100 plants. Include leading zeros when necessary (e.g., 0 8 9) for quantitative data. Comparative data should be determined from varieties entered in the same trial. Plant color may be precisely designated by using any recognized color chart, e.g., The Munsell Plant Tissue Color Charts.

1. WINTERHARDINESS:

2 CLASS:

- | | |
|--|--------------------------------------|
| 1 = Very Non-Winterhardy (CUF 101) | 2 = Non-Winterhardy (Moapa 69) |
| 3 = Intermediately Non-Winterhardy (Mesilla) | 4 = Semi-Winterhardy (Lahontan) |
| 5 = (Du Puits) | 6 = Moderately Winterhardy (Saranac) |
| 7 = (Ranger) | 8 = Winterhardy (Vernal) |
| 9 = Extremely Winterhardy (Norseman) | |

TEST LOCATION: Kerman, CA

2. FALL DORMANCY:

FALL DORMANCY (DETERMINED FROM SPACED PLANTINGS)

TESTING INSTITUTION AND LOCATION	DATE OF LAST CUT	DATE REGROWTH SCORED	REGROWTH SCORE OR AVERAGE HEIGHT				LSD .06
			APPLICATION VARIETY	CHECK VARIETIES*			
				CUF 101	Moapa 69	Mesilla	
Pioneer Hi-Bred International, Inc. Kerman, CA	9/28/89	10/18/89	44.7	47.8	45.3	33.6	2.46

* CUF 101, Moapa 69, Mesilla, Lahontan, Du Puits, Saranac, Ranger, Vernal, or Norseman as appropriate.

Specify scoring system used: Plant height measured in cm from spaced plants.

1 Fall Growth Habit (Determined from Fall Dormancy Trials)

- | | | |
|----------------------------|--------------------------|----------------------------|
| 1 = Erect (CUF 101) | 3 = Semierect (Mesilla) | 5 = Intermediate (Saranac) |
| 7 = Semidecumbent (Vernal) | 9 = Decumbent (Norseman) | |

3. RECOVERY AFTER FIRST SPRING CUT (In Southwest, first cut after March 21):

1

- | | | | |
|--------------------------|--------------------|---------------------------|-------------------|
| 1 = Very Fast (CUF 101) | 3 = Fast (Saranac) | 5 = Intermediate (Ranger) | 7 = Slow (Vernal) |
| 9 = Very Slow (Norseman) | | | |

TEST LOCATION: Kerman, CA

4. AREAS OF ADAPTATION IN U.S. (Where tested and proven adapted):

4 Primary Area of Adaptation

3 5 Other Areas of Adaptation

- | | | | |
|--|-------------------------------|------------------|---------------|
| 1 = North Central | 2 = East Central | 3 = Southeast | 4 = Southwest |
| 5 = Moderately Winterhardy Intermountain | 6 = Winterhardy Intermountain | 7 = Great Plains | |
| 8 = Other (Specify) _____ | | | |



5. FLOWERING DATE (When 10% of plants possess open flowers at time of first spring cut):

<input type="text"/> Days Earlier Than	<input type="text"/>
Same As	<input type="text"/>
<input type="text"/> Days Later Than	<input type="text"/>

1 = CUF 101

2 = Mesilla

3 = Saranac

4 = Vernal

5 = Norseman

Kerman, CA

5

10. B. INSECT RESISTANCE (Continued):

INSECT	VARIETY	SYN. GEN. TESTED	PERCENT SEEDLING SURVIVAL	NUMBER OF SEEDLINGS TESTED	ASI	ASI LSD .05	INSTITUTION, YEAR, LOCATION, FIELD OR LABORATORY
Blue Alfalfa Aphid (<i>Acyrtosiphon kondoi</i>)	Application R	1	41.0	Approx 250	3.77	ASI 0.37 Percent Resistant Plants 15.2	Pioneer Hi-Bred International, Inc. 1989 Johnston, IA Laboratory
	CUF 101 (R)		70.0	"	4.25		
	PA-1 (S)		4.0	"	3.06		
	SCORING SYSTEM: Plants scored 5-9 (on a 1-9 scale, where 9=no symptoms and 1=dead plant or severe stunting) considered resistant. Data adjusted to CUF 101 at 70% resistant plants by Pioneer Hi-Bred International, Inc.						
Pea Aphid (<i>Acyrtosiphon pisum</i>)	Application R	1	76.7	Approx 250		Percent Resistant Plants 25.3	Pioneer Hi-Bred International, Inc. 1988 Johnston, IA Laboratory
	Kanza (R) CUF 101 (HR)		70.0	"			
	Kanza (S) Caliverde (S)		28.9	"			
	SCORING SYSTEM: Percent surviving seedlings						
Spotted Alfalfa Aphid (<i>Therioaphis maculata</i>) Biotype, if known:	Application HR	2	84.8	Approx 250	4.80	ASI 1.10 Percent Resistant Plants 30.2	Pioneer Hi-Bred International, Inc. 1990 Kerman, CA Laboratory
	CUF 101 (HR) Kanza (R)		85.0 91.1	"	4.84 4.86		
	Ranger (S)		4.7	"	1.68		
	SCORING SYSTEM: Plants scored 7-9 (on a 1-9 scale, where 9=no symptoms and 1=dead plant) considered resistant. Data adjusted to CUF 101 at 85% resistant plants by Pioneer Hi-Bred International, Inc.						
INSECT	VARIETY	SYN. GEN. TESTED	PERCENT RESISTANT PLANTS	NUMBER OF PLANTS TESTED	ASI	ASI LSD .05	INSTITUTION, YEAR, LOCATION, FIELD OR LABORATORY
Potato Leafhopper Yellowing (<i>Empoasca fabae</i>)	Application						
	MSA-CW3An3 (R)						
	Ranger (S)						
	SCORING SYSTEM:						
Other (Specify)	Application						
	(R)						
	(S)						
	SCORING SYSTEM:						
C. NEMATODE RESISTANCE:							
NEMATODE	VARIETY	SYN. GEN. TESTED	PERCENT RESISTANT PLANTS	NUMBER OF PLANTS TESTED	ASI	ASI LSD .05	INSTITUTION, YEAR, LOCATION, FIELD OR LABORATORY
Northern Root Knot (<i>Meloidogyne hapla</i>)	Application						
	Nev. Syn. XX (R)						
	Lahontan (S)						
	SCORING SYSTEM:						

10. C. NEMATODE RESISTANCE (Continued):

NEMATODE	VARIETY	SYN. GEN. TESTED	PERCENT RESISTANT PLANTS	NUMBER OF PLANTS TESTED	ASI	ASI LSD .05	INSTITUTION, YEAR, LOCATION, FIELD OR LABORATORY
Southern Root Knot (<i>Meloidogyne incognita</i>)	Application						
	Moapa 69 (R)						
	Lahontan (S)						
	SCORING SYSTEM:						
Stem Nematode (<i>Ditylenchus dipsaci</i>)	Application R	1	51.6	Approx 250	2.20	ASI 0.36 Percent Resistant Plants 17.9	Pioneer Hi-Bred International, Inc. 1988 Kerman, CA Laboratory
	Lahontan (R)		60.0	"	2.14		
	Moapa 69 (S)		4.3	"	1.21		
	SCORING SYSTEM: Plants scored 7-9 (on a 1-9 scale, where 9=no symptoms and 1=dead plant) considered resistant. Data adjusted to Lahontan at 60% resistant						
Other (Specify)	Application						
	(R)						
	(S)						
	SCORING SYSTEM:						

11. INDICATE THE VARIETY THAT MOST CLOSELY RESEMBLES THE APPLICATION VARIETY FOR EACH OF THE FOLLOWING CHARACTERS:

CHARACTER	VARIETY	CHARACTER	VARIETY
Winterhardiness	Moapa 69	Plant Color	-
Recovery After 1st Cut	Moapa 69	Crown Type	Moapa 69
Area of Adaptation	Moapa 69	Combined Disease Resistance	DK187
Flowering Date	Moapa 69	Combined Insect Resistance	Maricopa

REFERENCES

- Barnes, D.K. 1972. A System for Visually Classifying Alfalfa Flower Color. U.S. Dep. Agric. Handb. 424. 18 pp. (Note: Greenish cast of plate 6, A and B is an artifact of printing, actual colors a blend of yellow and white.)
- Elgin, J.H., Jr., (ed.). 1982. Standard Tests to Characterize Pest Resistance in Alfalfa Cultivars. U.S. Dep. Agric. Tech. Bull. (In Press).
- Gunn, C.R., W.H. Skrdla, and H.C. Spencer. 1978. Classification of *Medicago sativa* L. using legume characters and flower colors. U.S. Dep. Agric. Tech. Bull. 1574. 84 pp.
- Munsell Color Co. 1977. Munsell Plant Tissue Color Charts. Munsell Color Co., Inc. Baltimore.

NOTE: Any additional descriptive information and supporting documentation may be provided as Exhibit D.

10. A. PEST RESISTANCE (Continued):

DISEASE	VARIETY	SYN. GEN. TESTED	PERCENT RESISTANT PLANTS	NUMBER OF PLANTS TESTED	ASI	ASI LSD .05	INSTITUTION, YEAR, LOCATION, FIELD OR LABORATORY
Downy Mildew (<i>Peronospora trifoliorum</i>)	Application						
Isolate, if known:	Saranac (R)						
	Kanza (S)						
SCORING SYSTEM:							
Fusarium Wilt (<i>Fusarium oxysporum</i> f. <i>medicaginis</i>)	Application HR	1	67.2	Approx 225	1.51	ASI 0.61	University of Minnesota
	Agate (R)		54.0	"	2.03		1989
	Mosops 69 (R)		71.6	"	1.43		Rosemount, MN
	MNGN-1 (S)		0.8	"	4.83		Field
SCORING SYSTEM: Plants scored 0 and 1 (on a 0-5 scale, where 0=no disease and 5=dead plant) considered resistant. Data adjusted to Agate at 54% resistant plants by the University of Minnesota.							
Phytophthora Root Rot (<i>Phytophthora megasperma</i> f. <i>medicaginis</i>)	Application R	1	41.5	Approx 250		Percent Resistant Plants	Pioneer Hi-Bred International, Inc.
	Agate (R)		43.0	"		17.7	1989
	Saranac (S)		4.7	"			Quarryville, PA Laboratory
SCORING SYSTEM: Greenhouse seedling damping off scored on percent surviving seedlings. Data adjusted to Agate at 43% resistant plants by Pioneer Hi-Bred International, Inc.							
Verticillium Wilt (<i>Verticillium albostrum</i>)	Application						
	Vertus (R)						
	Saranac (S)						
SCORING SYSTEM:							
Other (Specify)	Application						
	(R)						
	(S)						
SCORING SYSTEM:							
Other (Specify)	Application						
	(R)						
	(S)						
SCORING SYSTEM:							
B. INSECT RESISTANCE:	VARIETY	SYN. GEN. TESTED	PERCENT DEFOLIATION	DEFOLIATION IN PERCENT OF RESISTANT CHECK	ASI	ASI LSD .05	INSTITUTION, YEAR, LOCATION, FIELD OR LABORATORY
Alfalfa Weevil (<i>Hypena postica</i>)	Application						
	Arc (R)			100			
	Saranac (S)						
SCORING SYSTEM:							

EXHIBIT D

'5888'

APPLICATION FOR REVIEW OF ALFALFA VARIETIES FOR CERTIFICATION
National Alfalfa Variety Review Board

(The criteria for evaluation of applications were developed by the Joint Alfalfa Work conference and the Association of Official Seed Certifying Agencies.)

Applicant's Name: Pioneer Hi-Bred International, Inc. Date: 11/1/90
 Address: P.O. Box 287, Johnston, IA 50131
 Sponsoring Institution (if other than applicant) _____
 Breeder's Name (if other than applicant) _____
 Variety Name: 5888 Experimental Designation: XAN82, YAN82, 86SN711

Applicant's Signature William F. Woodward

The breeder or sponsoring institution or organization must describe and DOCUMENT in this application those characteristics of the variety which give it distinctiveness and merit by supplying the information requested below. Information must be supplied for each category excepting those listed as optional. Action will be deferred unless the application is sufficiently documented.

At the time a variety is accepted for certification, a seed sample of the generation or generations requested by the certifying agency shall be submitted to the certifying agency by the sponsor. This lot(s) is to be retained as a control sample against which all future seed stocks released for certified seed production may be compared to establish continued trueness of variety.

- I. A. Estimate the % of the germplasm sources listed below that contribute to the major genetic constitution of this variety.

<u>M.falcata</u>	<u>Ladak</u>	<u>M.varia</u>	<u>Turkistan</u>	<u>Flemish</u>	<u>Chilean</u>
		<u>3%</u>	<u>4%</u>		<u>3%</u>
<u>Peruvian</u>	<u>Indian</u>	<u>African</u>	<u>Arabian</u>	<u>Unknown</u>	
<u>1%</u>	<u>10%</u>	<u>71%</u>		<u>8%</u>	

- B. A statement of origin (including variety names, germplasm releases and/or PI numbers, and the number of plants or % contribution from each) and the breeding procedures or methods and selection criteria used in developing the variety. Include the procedure for producing breeder seed, the generation (e.g. Syn 1, Syn 2, etc.) that is considered breeder seed, and the year of breeder seed production.

5888 is a synthetic variety comprised from 108 plants originating from 5929 (50%) and a Pioneer experimental 75MA-1 (50%). 75MA-1 traces to N71 Brand (30%), Sonora (26%), El Camino (14%), Bonanza (2%), WL 202 (7%), WL 501 (4%), with smaller contribution from Moapa, Hayden and other Pioneer experimental lines. Parent plants were selected through phenotypic recurrent selection for Phytophthora root rot and stem nematode. Syn 1 seed harvested in 1986 and 1987 from parent plants in "cage isolation" and was bulked and designated breeder seed.

C. Seed class to be used, limitations on age of stand and areas of production for each class.

<u>Seed Class</u>	<u>Synthetic Generation</u>	<u>Length of Stand Allowed</u>	<u>Limitation on Areas for Seed Production</u>
Breeder	1	Two	None
Foundation	2 or 3	Three	None
Certified	2, 3 or 4	Five	None

Only the synthetic generations given for the above seed classes are recognized as representing this variety. (No supporting data should be used in this application from Syn. generations other than those for the Breeder, Foundation and Certified Classes listed here).

D. Procedures for maintaining seed stock:

Adequate breeder seed (syn 1) was produced in 1986 and 1987 and bulked to last the life of the cultivar on 108 plants in cage isolation. Seed classes will be breeder, foundation and certified. Foundation seed may be produced from breeder or foundation. The second generation foundation seed may be produced at the discretion of Pioneer Hi-Bred International, Inc. Both breeder and foundation seed will be maintained by Pioneer Hi-Bred International, Inc. Certified seed may be produced from breeder or foundation seed.

E. Any other requirements or limitations necessary to maintain varietal characteristics?

NONE

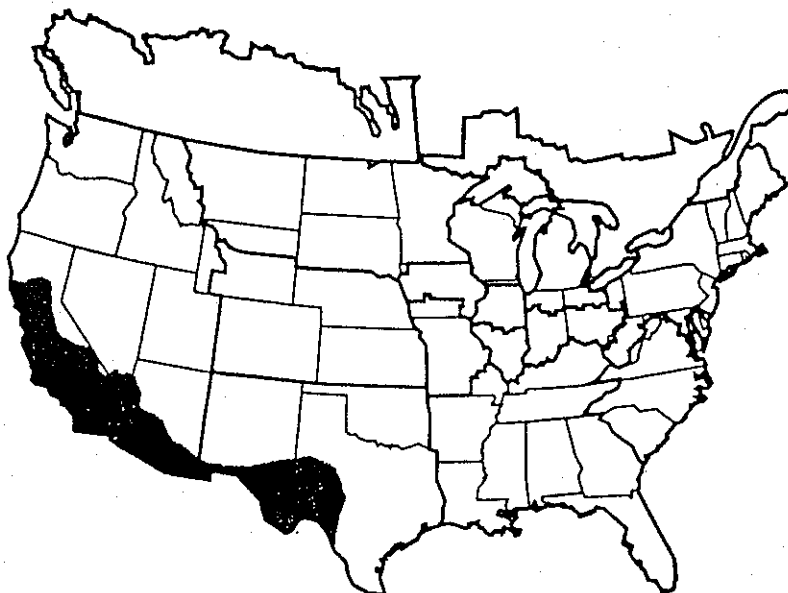
II. A. Describe the primary use of this variety (if for uses other than hay, haylage, greenchop or dehydration):

//

- B. List states and areas within states where tested for forage and/or persistence. (Present data from each location in III.A. and III.B.).

Kerman, Thornton and Visalia, CA

- C. Indicate proposed areas of adaptation and intended use on the map below.



III. Evidence of agronomic performance, including data on yield (in T/A) and persistence. Data may be from tests conducted by private firms, Agricultural Experiment Stations or USDA.

- A. Minimum required forage yield data is six location years with at least two locations (two locations must be at least 100 miles apart). Seeding year forage yield data cannot be used to satisfy this requirement. One location must have at least two harvest years beyond seeding year. Each harvest year should be listed separately.

Note: For non-dormant varieties (dormancy level of Moapa 69 or CUF 101) seeding year data may be accepted for up to two of the six location years when four or more cuttings are made in the seeding year.

Summarize Forage Yield Data below:

Test Location	Date Plntd Mo/Yr	Syn Gen	Year Hvst	No. Cuts	Test Variety	Total Yield (DM T/A)			LSD .05	CV%
						2. a	3. b	4. c		
KERMAN CA	3/87	1	87	5	8.7	9.4	7.4	7.7	1.34	12.26
	3/87	1	88	7	11.4	10.6	9.4	10.1	1.16	8.34
	3/87	1	89	7	14.6	14.7	12.7	14.2	1.47	7.88
KERMAN CA	3/88	1	88	6	9.6	9.4	9.3	9.8	1.15	8.46
	3/88	1	89	7	10.1	10.9	10.3	11.0	0.91	5.83
	3/88	1	90	6	12.7	12.5	12.4	13.2	1.05	5.63
KERMAN CA	3/89	1	89	4	8.2	8.2	7.1	7.5	1.46	14.45
	3/89	1	90	4	12.0	11.6	11.0	11.9	1.35	8.28
KERMAN CA	10/89	1	90	5	11.6	11.7	12.0	11.3	1.25	7.95
KERMAN CA	10/89	1	90	5	11.0	11.1	9.3	11.4	2.83	14.30
VISALIA CA	10/88	1	89	2	4.1	3.7	4.0	3.7	0.48	8.86
	10/88	1	90	5	11.3	11.2	10.9	10.9	1.76	8.01
VISALIA CA	10/89	1	90	5	3.3	3.1	3.0	3.2	0.35	6.86
THORNTON CA	3/86	1	87	6	11.8	11.6	11.2	10.7	1.17	7.80
	3/86	1	88	7	13.8	13.7	13.5	14.0	1.10	5.94
	3/86	1	89	5	7.6	7.2	7.2	8.0	1.20	11.99
THORTON CA	3/88	1	89	5	8.8	7.5	7.3	7.7	1.15	10.73
	3/88	1	90	5	6.2	5.9	4.8	6.1	0.89	10.69
THORNTON CA	3/89	1	90	5	10.5	10.5	9.4	10.4	1.23	7.65

1. a Moapa 692. b CUF 1013. c 5929

B

Mean Annual Yield				
	Years Hvstd	Total No. of Hvsts		
Ck 2 comparison	<u>19</u>	<u>101</u>	<u>9.9</u>	<u>9.7</u>
Ck 3 comparison	<u>19</u>	<u>101</u>	<u>9.9</u>	<u>9.1</u>
Ck 4 comparison	<u>19</u>	<u>101</u>	<u>9.9</u>	<u>9.7</u>

- B. Persistence (winter and drought tolerance, summer survival relative to check varieties). Enter dates of both Initial and Final stand estimates. Data must come from the area of adaptation and from stands at least two years old. More than one location must be given either when persistence is a trait used to justify release or when large diverse geographic areas of adaption are recommended.

Test Loc.	Syn Gen	Date Seeded Mo/Yr	Yrs. Hvtd	No. Hvts	Date of Readings Init/Final	Test Variety In/Fnl	%Stand Check Varieties			LSD .05	CV%	
							1. a		2. b			
							In/Fnl	In/Fnl	In/Fnl			In/Fnl
KERMAN												
CA	1	3/88	3	19	5-88/10-90	100/74	100/65	99/61	10.88	9.98		
THORNTON												
CA	1	3/87	3	18	5-87/10-90	97/95	94/94	93/93	3.12	2.28		
1. a Moapa 69												
2. b CUF 101												

Scoring System used: Data taken on minimum six inch units within each plot with a total plot size = 120 units.

- C. Fall dormancy relative to recognized varieties; check varieties must be chosen so as to bracket the dormancy data of this variety.

1. Test data

Test Location	Syn Gen	Date Last Cut	Date Measured	Score or average height			LSD .05	CV%	
				Test Variety	Check 1.	Varieties 2. 3.			
University of Minnesota	1	9/8/89	10/11/89	3.93	3.45	5.60	6.51	0.61	6.95
Kerman, CA	1	9/28/89	10/18/89	44.7	47.8	45.3	33.6	2.46	4.0

University of Minnesota check varieties:
1. African, 2. DuPuits, 3. Saranac

Pioneer Hi-Bred International, Inc. check varieties:
1. CUF 101, 2. Moapa 69, 3. Mesilla

Scoring system used: University of Minnesota - Plants scored on a 0-9 scale (0=18 inches or higher and 9 = 0-2 inches). Results reported as ASI.

Pioneer Hi-Bred International, Inc. - Plant height measured in cm from spaced plants; 29 plants/rep with 4 replications.

2. Indicate which of the following check varieties this variety most nearly compares to in fall dormancy.

VERY DORMANT	DORMANT	MOD. DORMANT	NON-DORMANT	VERY NON-DORMANT
Norseman ()	Vernal () Ranger ()	Saranac () DuPuits () Lahontan ()	Mesilla () Moapa 69(X)	CUF 101 ()

D. Seed production (this information optional).

Variety	Syn Gen	Test Location	Years Tested	Average Yield (lbs/A)
Test variety				
1.		No information		
2.				

IV. Other descriptive characteristics

- A. Flower color at full bloom. Syn generation observed 2
(see USDA Agriculture Handbook No. 424 - A System for
Visually Classifying Alfalfa Flower Color).

100 % purple % cream % yellow
_____ % variegated % white

- B. Growth habit: (erect, semi-erect or decumbent)

Mid summer erect

Fall erect

- C. Optional: (Document distinctive characteristics such as pod,
leaf or root traits, biochemical markers, etc.)

V. Pest Resistance Characteristics

PLEASE FOLLOW THESE INSTRUCTIONS CAREFULLY WHEN REPORTING PEST RESISTANCE RESULTS.

Furnish comparative data on the following insects and diseases (and others where applicable) for your variety. Data may be from tests conducted by private firms, Agricultural Experiment Stations, or USDA. Tests should be conducted by standard procedures as described in ARS Misc. publication 1434. Each disease and insect test must include recognized resistant and susceptible checks. Statistics must include the test mean (mean of all entries in test), LSD (.05), and CV (%). Resistance levels should be characterized using % resistant plants as follows: S=<6%, LR=6-14%, MR=15-30%, R=31-50%, HR=>50%. Do not refer to tolerance. Checks should be characterized based on long term % resistance averages published in ARS Misc. publication 1434. If data for the resistant check does not fit its expected resistance class (MR, R, HR, etc.) data must be adjusted to the long term mean. If data has been adjusted, supply both adjusted and unadjusted values and indicate how and by whom the adjustment was made.

At the time a variety is accepted for certification, a seed sample of the generation or generations requested by the certifying agency shall be submitted to the certifying agency by the sponsor. This lot(s) is to be retained as a control sample against which all future seed stocks released for certified seed production may be compared to establish continued trueness of variety.

If a scoring or rating system is used, specify the limits and meaning of scores. NOTE: If a pest reaction of the variety falls on or just above a resistance category level (+2% for LR, MR, and R; +3% for HR) and the higher rating is claimed, results of a second test must be reported. If the two tests do not agree, the lower rating is appropriate unless further testing supports the higher rating. Pest resistance data must be submitted on at least six of the following

nine pests: anthracnose, bacterial wilt, Fusarium wilt, Verticillium wilt, Phytophthora root rot, stem nematode, pea aphid, spotted alfalfa aphid, and blue alfalfa aphid. For the pests where no data is available write "Not tested". The six required pests must be selected from those that frequently cause significant losses on susceptible cultivars in the area of proposed adaptation of this variety. (Use the map you have shaded in IIC and compare with the maps of distribution and severity of alfalfa pests in ARS Misc. publication 1434. This will determine for which pests you must submit resistance information). Show generation of seed used for each test.

ANTHRACNOSE (Race 1)

Test conducted by _____ at _____

Variety	Resistance Class	Year Tested	Syn Gen	Unadjusted % Resist.	Adjusted % Resist.	Score or A.S.I.
---------	------------------	-------------	---------	----------------------	--------------------	-----------------

Test Variety

- 1.
- 2.
- 3.

Not Tested

Test Mean:
L.S.D. (.05)
C.V. (%)

Scoring system used: _____

BACTERIAL WILT

Test conducted by _____ at _____

Variety	Resistance Class	Year Tested	Syn Gen	Unadjusted % Resist.	Adjusted % Resist.	Score or A.S.I.
---------	------------------	-------------	---------	----------------------	--------------------	-----------------

Test Variety

- 1.
- 2.
- 3.

Not Tested

Test Mean:
L.S.D. (.05)
C.V. (%)

Scoring system used: _____

FUSARIUM WILTTest conducted by University of Minnesota at Rosemount, Minnesota

Variety	Resistance Class	Year Tested	Syn Gen	Unadjusted % Resist.	Adjusted % Resist.	Score or A.S.I.
Test Variety	HR	1989	1	78.1	67.2	1.51
1. Moapa 69	HR			83.2	71.6	1.43
2. Agate	R			62.8	54.0	2.03
3. MNGN-1	S			0.9	0.8	4.83
Test Mean:				57.1		2.18
L.S.D. (.05)				14.53		0.61
C.V. (%)				15.82		17.56

Scoring system used: Plants scored 0 and 1 (on a 0-5 scale, where 0=no disease, and 5=dead plant) considered resistant. Data Adjusted to Agate at 54% resistant plants by the University of Minnesota.

VERTICILLIUM WILT

Test conducted by _____ at _____

Variety	Resistance Class	Year Tested	Syn Gen	Unadjusted % Resist.	Adjusted % Resist.	Score or A.S.I.
Test Variety						
1.						
2.						
3.						
		Not Tested				
Test Mean:						
L.S.D. (.05)						
C.V. (%)						

Scoring system used: _____

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PHYTOPHTHORA ROOT ROT

Test conducted by Pioneer Hi-Bred International, Inc. at Arlington, WI

Variety	Resistance Class	Year Tested	Syn Gen	Unadjusted % Resist.	Adjusted % Resist.	Score or A.S.I.
Test Variety	R	1990	2	43.5	32.3	5.39
1. Agate	R			58.0	43.0	6.14
2. Saranac	S			5.3	3.9	2.40
3. Legend	HR			57.9	42.9	6.29
4. Magnum III	R			30.1	22.3	4.30
5. WL 317	HR			47.2	35.0	5.32
Test Mean:				46.5	33.8	5.50
L.S.D. (.05)				16.1	11.7	0.86
C.V. (%)				25.0	25.0	11.00

Scoring system used: Plants scored 7-9 (on a 1-9 scale, where 9=no symptoms and 1=dead plant) considered resistant. Data adjusted to Agate at 43% resistant plants by Pioneer Hi-Bred International, Inc.

PHYTOPHTHORA ROOT ROT

Test conducted by Pioneer Hi-Bred International, Inc. at Quarryville, PA

Variety	Resistance Class	Year Tested	Syn Gen	Unadjusted % Resist.	Adjusted % Resist.	Score or A.S.I.
Test Variety	R	1989	1	27.7	41.5	
1. Agate	R			28.7	43.0	
2. Saranac	S			3.2	4.7	
3.						
Test Mean:				24.0	36.0	
L.S.D. (.05)				11.8	17.7	
C.V. (%)				35.5	35.5	

Scoring system used: Greenhouse seedling damping off scored as % surviving seedlings. Data adjusted to Agate at 43% resistant plants by Pioneer Hi-Bred International, Inc.

STEM NEMATODE

Test conducted by Pioneer Hi-Bred International, Inc. at Kerman, CA

Variety	Resistance Class	Year Tested	Syn Gen	Unadjusted % Resist.	Adjusted % Resist.	Score or A.S.I.
Test Variety	R	1988	1	16.6	51.6	2.20
1. Lahontan	R			19.3	60.0	2.14
2. Moapa 69	S			1.4	4.3	1.21
3.						
Test Mean:				11.8	39.8	1.80
L.S.D. (.05)				5.8	17.9	0.36
C.V. (%)				30.0	30.0	13.00

Scoring system used: Plants scored 7-9 (on a 1-9 scale, where 9=no symptoms and 1=dead plant) considered resistant. Data adjusted to Lahontan at 60% resistant plants by Pioneer Hi-Bred International, Inc.

STEM NEMATODE

Test conducted by Pioneer Hi-Bred International, Inc. at Kerman, CA

Variety	Resistance Class	Year Tested	Syn Gen	Unadjusted % Resist.	Adjusted % Resist.	Score or A.S.I.
Test Variety	R	1990	2	24.6	43.2	3.86
1. Lahontan	R			34.2	60.0	4.31
2. Caliverde 65	MR			7.8	11.5	3.20
3. Moapa 69	S			0.0	0.0	2.00
Test Mean:				14.2	24.9	3.00
L.S.D. (.05)				8.5	14.0	0.71
C.V. (%)				38.0	38.0	15.00

Scoring system used: Plants scored 7-9 (on a 1-9 scale, where 9=no symptoms and 1=dead plant) considered resistant. Data adjusted to Lahontan at 60% resistant plants by Pioneer Hi-Bred International, Inc.

PEA APHID

Test conducted by Pioneer Hi-Bred International, Inc. at Johnston, IA

Variety	Resistance Class	Year Tested	Syn Gen	Unadjusted % Resist.	Adjusted % Resist.	Score or A.S.I.
Test Variety	R	1988	1	60.6	76.7	
1. CUF 101	HR			55.3	70.0	
2. PA-1	HR			56.0	70.9	
3. Caliverde	S			22.9	28.9	
Test Mean:				47.6	60.2	
L.S.D. (.05)				20.0	25.3	
C.V. (%)				26.0	26.0	

Scoring system used: % surviving seedlings. Test was infested with a mixture of pea aphids collected from Iowa, Minnesota, Wisconsin, and Pennsylvania. Data adjusted to CUF 101 at 70% resistant plants by Pioneer Hi-Bred International, Inc.

SPOTTED ALFALFA APHID

Test conducted by Pioneer Hi-Bred International, Inc. at Kerman, CA

Variety	Resistance Class	Year Tested	Syn Gen	Unadjusted % Resist.	Adjusted % Resist.	Score or A.S.I.
Test Variety	HR	1990	2	41.4	84.8	4.80
1. CUF 101	HR			41.5	85.0	4.84
2. Kanza	HR			44.5	91.1	4.86
3. Caliverde	S			1.2	2.5	1.20
4. Ranger	S			2.3	4.7	1.68
5. Team	S			0.0	0.0	1.00
Test Mean:				32.8	67.2	4.20
L.S.D. (.05)				14.8	30.2	1.10
C.V. (%)				28.0	28.0	16.00

Scoring system used: Plants scored 7-9 (on a 1-9 scale, where 9=no symptoms and 1=dead plant) considered resistant. Data adjusted to CUF 101 at 85% resistant plants by Pioneer Hi-Bred International, Inc.

BLUE ALFALFA APHID

Test conducted by Pioneer Hi-Bred International, Inc. at Johnston, IA

Variety	Resistance Class	Year Tested	Syn Gen	Unadjusted % Resist.	Adjusted % Resist.	Score or A.S.I.
Test Variety	R	1989	1	27.8	41.0	3.77
1. CUF 101	HR			47.5	70.0	4.25
2. 5929	HR			56.5	83.3	4.63
3. Caliverde	S			1.8	2.7	3.01
4. PA-1	S			2.7	4.0	3.06
Test Mean:				20.4	30.1	3.50
L.S.D. (.05)				10.3	15.2	0.37
C.V. (%)				31.0	31.0	7.0

Scoring system used: Plants score 5-9 (on a 1-9 scale, where 9=no symptoms and 1=dead plant or severe stunting) considered resistant. Data adjusted to CUF 101 at 70% resistant plants by Pioneer Hi-Bred International, Inc. Blue alfalfa aphids supplied by Oklahoma State University.

Please attach a one page description/summary of your variety as you wish it published by AOSCA. This description must stand on its own; please use complete sentences.

Include the following:

1. A statement of genetic origin (including variety names, germplasm releases, and/or PI numbers that contributed to the major genetic constitution of this variety) and the breeding procedures, methods, and selection criteria used in developing the variety. Estimate the % of the major germplasm sources contributing to this cultivar (see I.A.)
2. Area of probable adaptation (geographic area) and primary purpose (hay, grazing, etc.) for which this variety will be used. Report states where the variety has been tested for yield and persistence and proposed areas of intended use.
3. Other descriptive characteristics such as flower color, fall dormancy, and other morphological or physiological identifying traits.
4. A statement relative to its resistance to anthracnose, bacterial wilt, Fusarium wilt, Verticillium wilt, Phytophthora root rot, stem nematode, pea aphid, spotted alfalfa aphid, and blue alfalfa aphid.
5. Procedures for maintaining seed stock, seed classes to be used, a statement as to the limitation of age of stand and generations that may be certified and other requirements or limitations necessary to maintain varietal characteristics.
6. If this variety is accepted by official certifying agencies, when will certified seed first be offered for sale?
7. Will application be made for protection under the Plant Variety Protection Act and if so, will the certification option be requested?
8. As a means of added varietal protection, are you willing to have the information in this application turned over to the PVP office?

1. 5888 is a 108 plant synthetic cultivar with parents selected through phenotypic recurrent selection and originating from several experimental lines tracing to 5929, Bonanza, El Camino, Hayden, Moapa, N71 Brand, Sonora, WL 501 and WL 202. Parent plants were selected for one or more of the following: Phytophthora root rot and stem nematode. Germplasm sources are: *M. varia* (3%), Turkistan (4%), Chilean (3%), Peruvian (1%), Indian (10%), African (71%), with 8% unknown.
2. 5888 is intended for use in the San Joaquin and Imperial valleys of California and the low desert areas of Arizona, California, New Mexico and Texas for hay, haylage, greenchop and dehydration. It is expected to be adapted where other nondormants are grown. 5888 has been tested in California. The variety has been tested using the following experimental designations: XAN82, YAN82 and 86SN711.
3. 5888 is a nondormant variety with fall dormancy similar to Moapa 69. Flower color of the Syn 2 generation is purple. Growth habit is erect in mid summer and the fall.
4. 5888 has high resistance to Fusarium wilt and spotted alfalfa aphid; resistance to blue alfalfa aphid, pea aphid, Phytophthora root rot and stem nematode. 5888 has not been adequately tested for bacterial wilt, Verticillium wilt, or anthracnose.
5. Breeder seed (Syn 1) was produced over a two year period on parent plants in "cage isolation" and bulked. Seed classes will be breeder, foundation (Syn 2 or Syn 3), and certified (Syn 2, Syn 3 or Syn 4). Foundation seed may be produced from breeder or foundation. The second generation foundation may be produced at the discretion of Pioneer Hi-Bred International, Inc. Limitation on ages of stand will be three and five years for foundation and certified seed, respectively. Sufficient breeder and foundation seed for the projected life of the variety will be maintained by Pioneer Hi-Bred International, Inc.
6. Seed will be marketed in the fall of 1990.
7. Application for Plant Variety Protection will be made and the certification option will not be requested.
8. As a means of added varietal protection, information included with Application for Review of Alfalfa Variety for Certification may be provide to the PVP office.

EXHIBIT E

STATEMENT OF THE BASIS OF APPLICANT'S OWNERSHIP

'5888'

Pioneer Hi-Bred International, Inc., Des Moines, Iowa, is the employer of the plant breeders involved in the development and evaluation of 5888. Pioneer Hi-Bred International, Inc. has the sole rights and ownership of 5888.